DOCUMENT RESUME

ED 035 459 PS 002 787

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TITLE Industrial Arts for the Primary Grades.
INSTITUTION Pennsylvania State Dept. of Public Instruction, Harrisburg. Bureau of General and Academic Education.
PUB DATE 69
NOTE 12p.

EDRS PRICE EDRS Price MF-$0.25 HC-$0.70
DESCRIPTORS Class Activities, Educational Objectives, *Industrial Arts, Learning Experience, *Primary Grades, *Teaching Techniques

ABSTRACT

This article, part of a series compiled by the Division of Early Childhood Education, is intended to help elementary teachers develop the proper teaching methods, procedures, and knowledge of available materials for the implementation of industrial arts activities. The article includes sections on the theory of industrial arts in the elementary school, the objectives of elementary industrial arts, the use of industrial arts to improve the learning experience, and classroom approaches to employing elementary industrial arts. A bibliography is included. (Author/JF)

Industrial Arts For The Primary Grades

This article, written by RONALD B. HALL, Industrial Arts Adviser, is part of a series included in the Primary Packet of Materials. The packet is compiled by the Division of Early Childhood Education, Mrs. Charlotte G. Garman, Coordinator.

Prepared by
Bureau of General and Academic Education
Pennsylvania Department of Education
1969

TABLE OF CONTENTS

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F O R E W O R D

Industrial arts activities, as related to elementary education, are not new stars on the educational horizon. The fact remains, however, that a great many elementary school curriculums lack any provisions for including industrial arts activities. This condition can be attributed in part to the fact that many elementary teachers have either not been exposed to or are unfamiliar with the techniques of incorporating these activities into the educational fabric of their daily programs.

The intent of this publication is to help the elementary teacher develop the proper justification, teaching methods and procedures and knowledge of available materials for the implementation of industrial arts activities within the elementary education program.

THE THEORY OF INDUSTRIAL ARTS IN THE ELEMENTARY SCHOOL PROGRAM

Industrial arts is concerned with bringing about increased meaning and understanding to units of instruction in the elementary school through the utilization of construction activities. These construction activities may be integral parts of either individual or group projects. Another way of saying this might be that the purpose of industrial arts in the elementary school is to assist through construction activity in the introduction, presentation, and reinforcement of the accepted subject matter fields.

Wendell Swanson at Western Illinois University has described the function of industrial arts in elementary education as dealing with the study, experimentation, and manipulation of raw materials and with the industrial processes which man carries on in his endeavor to harness his environment to his needs. In simple words, it is the study of how he makes the world work for him.

Although the title of the program tends to be misleading, the primary objective is to utilize industrial arts as a teaching tool rather than for the teaching of tools. In this respect, it is reasoned that levels of abstraction can be reduced in order to present traditional studies in a more concrete fashion. An example of this is the concept of size, volume, and distance being vividly related by actually using materials that are in three dimensions.

At this level industrial arts should not be considered as a separate subject but rather uniquely as both a method and subject area. Edwin Kurth explains industrial arts as seen in terms of a subject area and a method

of teaching in this way:

> "It is a subject area when the emphasis on the activities and materials results in children learning how people throughout the world have used the tools and materials of their environment to raise their level of living. As a subject, it satisfies children's need for constructive activity and encourages them to use a variety of media for creative expression. As a method or way of teaching, the learnings in industrial arts come from children's natural interests in activity and in manipulative materials and devices as a means for expressing themselves. Activities help children relate in a functional way the information taught in all areas."

OBJECTIVES OF ELEMENTARY INDUSTRIAL ARTS

Specific objectives for industrial arts in the elementary school? NEVER! There should be no prepared curriculum, no special skills or understanding to be developed, no sequential content to be covered, no stated objectives for these children, no plans for motivating them. Instead, elementary industrial arts has one general objective which is to offer a rich environment and provide guidance in interacting with this environment more effectively.

George B. Leonard, Look Magazine's Senior Editor, further clarifies these ideas:

> "When a child, age five, enters school, he is a learner of awesome speed and staying power. Many of his reactions are quicker, his perceptions finer than yours or mine. He is a tireless explorer, a spontaneous scientist and a recent veteran of our species' most impressive feat of learning; the mastery of the spoken tongue. Some

experts have called his attention span short, but they are wrong. The young child is learning practically all the time. The young child is learning all the time. He becomes impatient only because the traditional school situation is dull, unnatural, adult-centered and child-confining. Today, a growing number of educators are rediscovering old truths: Education is not the process of filling a child's head with facts while restricting and reducing his activity. On the contrary, the moment of learning is active, intense and often joyful. To find it, you look not at what the teacher is saying and doing but at how the child is responding. Such responses, such moments are the real stuff of education. Through them, the child develops relationships with the world, not just the ABC's of it but its tastes and textures."

The child will employ industrial arts activities as extensions of his own facilities when he endeavors to effectively deal with his environment. He will extend his physical powers through the use of levers, wheels, and energy sources, extend his senses through the use of the microscope, telescope, radio, and television and even extend his brain through the use of computers. Children will find many opportunities for the use of the activities associated with industrial arts as they interact with the environment through all areas of learning.

An elementary school industrial arts program helps children in a number of ways according to Wesley Perusek, Kent State University School, Kent, Ohio. Seven of these ways are presented here.

(1) Developing confidence in oneself and respect for tools and materials as these things help develop an expressive outlet for children.

(2) Providing personal involvement with materials, tools, construction methods and the problems and processes in altering materials.

(3) Helping children develop an understanding and appreciation of things around us, how they got there and how they work or serve to help us in our daily lives: the wood, steel and ceramic materials of our structures, the clothing we wear, the food we eat or the mechanical things we use.

(4) Helping children understand and appreciate how goods are produced in quantity and the problems and satisfactions in manufacturing a useful product.

(5) Helping children develop an awareness of and skills in planning, measuring, accuracy and in satisfying what might be called the constructive instinct in all of us.

(6) Helping children in the development and understanding of science concepts and the interdependence and relatedness of subjects in the curriculum, and in establishing meaningful need for cooperative effort, language, reading and mathematics.

(7) Helping children understand the world of work as they work to transform materials, use tools, plan, carry out a construction problem or experience and succeed or sometimes fail in their efforts.

USE OF INDUSTRIAL ARTS TO IMPROVE THE LEARNING EXPERIENCE

One of the better ways of clarifying how industrial arts activities can become an integrated part of the educational fabric of the elementary school is to use actual examples of how other teachers have successfully employed these techniques.

In one instance, the amazing world of magnets and magnetism was presented by the elementary industrial arts consultant to the kindergarten students. Initially, the kindergarten teacher told an interesting story concerned with a little shepherd boy, living years ago, who accidently discovered the effects of magnetism while walking about hills and mountains containing natural magnets. Following this, many activities requiring the use of magnets and magnetism were conducted. Everyone found the experiment with the compass to be exciting in that it pointed directly to the North Pole and Santa's House. Two of the strongmen in this class conducted a tug-of-war as they tried to separate two large magnets. These children also found out that magnets are very particular because they attract only things made of iron or steel.

First grade students who studied their environment, were able to demonstrate why it is colder at night than during the day in a classroom experiment with a globe, large scale thermometer, heat lamp, and lamp stand. Through manipulation of these aids the class realized that the rays of the sun provide the earth with heat as well as light and that nights are colder than days because of the absence of solar heat.

A social studies problem concerning Pilgrim's housing provided opportunities for an eager group of first graders to explore the types of housing available to the early settlers of our country. Numerous discussions were held revolving around the techniques of constructing these log houses. Each child made drawings of his own log house and then constructed a small replica of the log house he had drawn. Wood, paper, glue and crayons were used to construct the realistic "cabins." These helped to reduce the level of abstraction surrounding this particular social studies unit.

A science unit on man's use of wheels for transportation proved to be extremely interesting to an eager second grade class. Classroom discussions were conducted concerning the varied uses man has for the wheel, including its use for transportation. A visit to a nearby museum gave the class an opportunity to examine and study various models and objects with wheels. Upon their return from the museum everyone began to design his own wheeled vehicle. The types of vehicles were as varied as the children in the class; buses, trucks, cars, covered wagons, trains, with fire engines being the most popular. The first step for each child was the construction of the paper bodies. Following this, each child constructed a frame for his vehicle from white pine, plywood, nails and white glue. After attaching the wheels to the frame, he road tested his vehicle as a culminating activity of this unit. The time devoted to this activity was three work sessions spanning a two week period.

A third grade class found that it was much easier to learn linear measurement by applying it to a project rather than by merely studying a wooden foot ruler. It was decided that a wooden box would be a suitable project providing many opportunities to involve linear measuring techniques. All of the parts for the box were precut by the industrial arts consultant and distributed to the children during an arithmetic class. Using wooden foot rulers each child proceeded to measure each individual part. Later, all the parts were temporarily assembled and the box once again measured. Thickness, width and length of three-dimensional objects were now discussed. The final operation of this activity was conducted in the school's industrial arts laboratory, where each child permanently assembled the box using nails, glue, and hammers. The abstract concepts surrounding linear measure-

ment were substantially reduced to concrete terms, by using examples, practice, and involvement.

An earth science unit concerned with the various surface structures of earth interested a group of third grade children. The class decided they would construct a model village which would depict these surface variations. The class was divided into several groups and armed with chicken wire, toilet tissue, plaster of paris, wood, steel wool, aluminum foil, and paint and set out to develop an authentic model which would show effects of mountains and valleys, rivers and lakes, plains and deserts upon the people who would inhabit these villages. The total project required each group of ten children to spend approximately 45 minutes, one a week, for a period of three weeks.

Most of the aforementioned activities were designed to enhance or enrich a unit in reading, social studies, mathematics, or sicence. It was through these activities that the high levels of abstraction were reduced to concrete, practical, firsthand experiences which are so meaningful to young students.

CLASSROOM APPROACHES TO EMPLOYING ELEMENTARY INDUSTRIAL ARTS

There are several basic plans for including industrial arts activities in elementary school programs. The first of these involves the regular elementary classroom teacher who conducts instruction in the self-contained classroom at the moment when the students are ready to discuss a particular concept.

A second method involves using an industrial arts consultant or specialist whose primary duties are to assist the regular elementary classroom teacher with developing ideas, using tools, materials and processes, and

providing special instruction and demonstrations when needed. All activities are conducted in the self-contained classroom and under the direct supervision of the classroom teacher.

The use of a specially constructed industrial arts laboratory is still another approach to providing industrial arts activities in the elementary school. This approach utilizes both the classroom teacher and the industrial arts consultant in developing group activities related to the elementary curriculum which require facilities of this nature. The groups are scheduled for varying amounts of time, based on the curriculum units to cover in this phase of the program.

The type of industrial arts program used in a particular school becomes dependent upon the activity and grade level involved. In actual practice one will generally find all of the above approaches operating simultaneously within a given school, each approach providing meaningful activities which are correlated with the elementary school curriculum.

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